

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA22 | Whittington to Handsacre

Construction assessment (SV-003-022)

Sound, noise and vibration

November 2013

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Department
for Transport

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Appendix SV-003-022

Environmental topic:	Sound, noise and vibration	SV
Appendix name:	Construction assessment	003
Community forum area:	Whittington and Handsacre	022

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1 Introduction

- 1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these is an introduction to the relevant route-wide methodology, assumptions and assessment (Volume 5: Appendix SV-100-000). This relates to the sound, noise and vibration assessment for all community forum areas (CFA).
- 1.1.2 For the Whittington and Handsacre community forum area (CFA22), the other three sections are as follows:
- baseline sound, noise and vibration (Appendix SV-002-022);
 - construction sound, noise and vibration (Appendix SV-003-022) (this appendix); and
 - operational sound, noise and vibration (Appendix SV-004-022).
- 1.1.3 The outcomes of the assessment are summarised in Volume 2: CFA22 Report, Section 11 Sound, Noise and Vibration.
- 1.1.4 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5 map book.
- 1.1.5 This appendix presents the likely noise and vibration impacts, effects and significant effects arising from the construction of the Proposed Scheme for the Whittington and Handsacre area on:
- people, primarily where they live ('residential receptors') in terms a) individual dwellings and b) on a wider community basis, including any shared community open areas; and
 - community facilities such as schools, hospitals, places of worship, and also commercial properties such as offices and hotels, collectively described as 'non-residential receptors' and 'quiet areas'.
- 1.1.6 The assessment of likely impacts, effects and significant effects from construction noise and vibration on agricultural, community, ecological or heritage receptors and the assessment of tranquillity are presented in the following documents within Volume 5:
- Agriculture, forestry and soils Appendix AG-001-022;
 - Community Appendix CM-001-022;
 - Ecology Appendix EC-005-022;
 - Heritage Appendix CH-003-022; and
 - Landscape and Visual Appendix LV-001-022.

1.2 Evaluation of impacts and effects

- 1.2.1 This appendix provides a quantitative assessment of construction noise and vibration impacts/effects and a qualitative assessment of likely significant effects, based on the

impacts/effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.

- 1.2.2 Indirect effects arising from temporary changes in traffic patterns on the existing road network as a consequence of constructing the Proposed Scheme are also reported in this appendix, where they would occur within the study area as defined in Volume 5: Appendix SV-001-000.
- 1.2.3 In undertaking the assessment of sound and vibration, consistent with Environmental Impact Assessment (EIA) Regulations and emerging National Planning Practice Guidance¹, a differentiation between impacts effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV001-000.
- 1.2.4 The assessment of impacts and effects has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The Assessment Locations employed in this assessment are presented on map series Sv-03 in the CFA22 Volume 5 sound, noise and vibration map book.

¹ Information is provided in the emerging National Planning Practice Guidance – Noise <http://planningguidance.planningportal.gov.uk>, refer to the noise exposure hierarchy

2 Scope, assumptions and limitations

2.1 Regional and local policy guidance

2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1 and in Volume 5: Appendix SV-001-000. As part of the engagement with local authorities, through the Planning Forum Sub Group - Acoustics, information regarding any specific local planning guidance in respect of noise and vibration has been requested. Whilst no information has been received for this study area via the Planning Forum Sub Group - Acoustics, the following local policy guidance on noise and vibration has been identified:

- The Lichfield District Council – Local Plan – Our Strategy (July 2012)

2.1.2 This guidance has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5: Appendix SV-001-000.

2.2 Engagement

2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners via the Planning Forum Sub Group - Acoustics, is set out in Volume 1.

2.2.2 Engagement with communities has been via the Community Forums, as set out in Volume 1. In respect of sound, noise and vibration the following discussions have taken place:

- general discussions in respect of local issues, including possible ways to avoid and mitigate the potential impacts of noise or vibration
- September/October 2012; a specific presentation about sound, noise and vibration with discussion afterwards with one of the project team specialists;
- November/December 2012; specific request for the Community Forum to propose baseline sound monitoring locations;
- January/February 2013; feedback to the Community Forum on any proposed baseline monitoring locations; and
- verbal/written response to questions and sound, noise and vibration.

2.3 Methodology

2.3.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1), and clarified in a number of areas by the SMR addendum (Volume 5: Appendix CT-001-000/2). Further information is contained in Volume 5: Appendix SV-001-000.

2.4 Assumptions

2.4.1 Route-wide assumptions are outlined in Volume 1 and are further detailed in Volume 5: Appendix SV-001-000. Local assumptions that apply to the assessment of

construction sound, noise and vibration within this CFA are set out in Volume 2: Report 22.

2.5 **Limitations**

- 2.5.1 The route-wide limitations and the approach adopted to assure that they will not impact the robust assessment of sound, noise and vibration are presented in Volume 5: Appendix SV-001-000. In this area, there are a number of locations where the land or property owners did not permit baseline sound level monitoring to be undertaken at their premises. However, sufficient information has been obtained to undertake the assessment. Further information is provided in Volume 5: Appendix SV-002-022.

3 Environmental Baseline

3.1 Existing baseline

- 3.1.1 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors. The existing and future baseline airborne sound levels derived from these measurements are given in Volume 5: Appendix SV-002-022. Details of the baseline data collection and the methodology are given in Volume 5: Appendix SV-001-000 and specifically for this study area in Volume 5: Appendix SV-002-022.

3.2 Future baseline

- 3.2.1 The assessment of noise from construction activities assumes a baseline year of 2017 which represents the period immediately prior to the start of the construction period. As a reasonable worst case, it has been assumed that no change in baseline sound levels will occur between the existing baseline (2012/13) and the future baseline year of 2017. The assessment of noise from construction traffic assumes a baseline year of 2021, representative of the middle of the construction period when the construction traffic flows are expected to be at their peak. Further information can be found in the Traffic and Transport assessment (Appendix TT-001-022).

4 Effects arising during construction

4.1 Introduction

- 4.1.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts and effects are presented. This is followed by the identification of significant effects and the evidence used to support these conclusions.
- 4.1.2 The structure of this assessment report is:
- avoidance and mitigation measures;
 - quantitative identification of impact and effects:
 - ground-borne sound and vibration:
 - residential; and
 - non-residential.
 - airborne sound:
 - residential; and
 - non-residential.
 - assessment of impacts and effects:
 - residential receptors: direct effects – dwellings;
 - residential receptors: direct effects – communities;
 - residential receptors: indirect effects;
 - non-residential receptors: direct effects;
 - non-residential receptors: indirect effects; and
 - cumulative effects from the proposed scheme and other committed development.

4.2 Avoidance and mitigation measures

- 4.2.1 These are set out in Volume 2: Report 22.

4.3 Quantitative identification of impacts and effects

Ground-borne vibration

- 4.3.1 Assessment locations defined for the quantitative assessment of impacts are shown on map series SV-02 in the CFA22 Volume 5 sound, noise and vibration map book.
- 4.3.2 For each Assessment Location, the assessment results for residential and non-residential receptors are presented in Table 1. Explanation of the information in

Table 1 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

	Where the significant effect column is highlighted, then a significant effect is identified at the referenced community, or individual receptor.
*	Significant effect – the quantitative impact methodology has identified either: <ol style="list-style-type: none"> 1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or 2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not give rise to a significant effect
~	Significant effect – the forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000)
A	Type of effect – adverse effect
S	Type of effect – significant adverse effect
NA	Type of effect – not generally an adverse effect
B	Type of effect – for non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000
V1	Type of receptor – (V1) vibration sensitive research and manufacturing, hospital, and university equipment, (V2) hotels, hospital wards and education dormitories, (V3) offices, schools and places of worship, (V4) workshops
T	Receptor design – typical
S	Receptor design - special

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Table 1: Assessment of construction induced ground-borne vibration at residential receptors

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Peak particle velocity (PPV) [mm/s] on foundation	Typical/highest monthly indoor vibration dose value (VDV) [m/s ^{1.75}]		Construction activity resulting in highest forecast vibration levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
623	Tuppenhurst Lane, Rugeley	0.39	0.19/0.19	-	Earthworks	NA	3	R	T	-	-	-	-	-	
17473	Lichfield Road, Whittington, Lichfield	0.19	0.1/0.1	-	Earthworks	NA	2	R	T	-	-	-	-	-	
17519	Darnford Lane, Lichfield	0.17	0.04/0.04	-	Earthworks	NA	2	R	T	-	-	-	-	-	
17748	Park Lane, Huddlesford, Lichfield	0.36	0.17/0.17	-	Earthworks	NA	1	R	T	-	-	-	-	-	
17785	Cappers Lane, Lichfield	0.23	0.12/0.12	-	Earthworks	NA	1	R	T	-	-	-	-	-	
20090	Shaw Lane, Hanch, Lichfield	0.27	0.13/0.13	-	Earthworks	NA	2	R	T	-	-	-	-	-	
20138	Shaw Lane, Hanch, Lichfield	0.23	0.06/0.06	-	Earthworks	NA	1	R	T	-	-	-	-	-	
20441	Wood End Lane, Curborough, Lichfield	0.38	0.18/0.18	-	Earthworks	NA	1	R	T	-	-	-	-	-	
22478	Wood End Lane, Fradley, Lichfield	0.13	0.07/0.07	-	Earthworks	NA	4	R	T	-	-	-	-	-	
22664	Burton Road, Streethay, Lichfield	0.27	0.13/0.13	-	Earthworks	NA	1	R	T	-	-	-	-	-	
22669	Burton Road, Streethay, Lichfield	0.51	0.12/0.12	-	Earthworks	NA	1	R	T	-	-	-	-	-	
31347	Broad Lane, Huddlesford, Lichfield	0.41	0.19/0.19	-	Streethay Railhead	NA	1	R	T	-	-	-	-	-	
31367	Huddlesford, Lichfield	0.37	0.18/0.18	-	Streethay Railhead	NA	3	R	T	-	-	-	-	-	
701090	Burton Road, Streethay, Lichfield	0.12	0.07/0.07	-	Streethay Railhead	NA	1	R	T	-	-	-	-		

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Peak particle velocity (PPV) [mm/s] on foundation	Typical/highest monthly indoor vibration dose value (VDV) [m/s ^{1.75}]		Construction activity resulting in highest forecast vibration levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
700649	Cappers Lane, Lichfield	0.29	Day 0700-2300	Night 2300-0700	Earthworks	NA	1	R	T	-	-	-	-	-	
721030	Whittington Common Lane, Whittington, Lichfield	0.36	0.17/0.17	-	Earthworks	NA	1	R	T	-	-	-	-	-	

Appendix SV-003-022 | Effects arising during construction

Table 2: Assessment of construction induced ground-borne vibration at non-residential receptors

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	PPV [mm/s] on foundation	Typical/highest monthly indoor VDV [m/s ^{1.75}]		Construction activity resulting in highest forecast vibration levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
			Day 0700-2300	Night 2300-0700											
31367	Huddlesford, Lichfield	0.37	0.18/0.18	-	Streethay Railhead	B	2	V ₃	T	-	-	-	-	-	
22478	Wood End Lane, Fradley, Lichfield	0.13	0.07/0.07	-	Earthworks	B	2	V ₃	T	-	-	-	-	-	
18665	Wood End Lane, Fradley, Lichfield	0.13	0.03/0.03	-	Earthworks	B	11	V ₃	T	-	-	-	-	-	

Airborne sound: direct impacts and effects

- 4.3.3 Activities associated with the construction phases of the Proposed Scheme would generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:
- residential receptors, both as individual dwellings and communities;
 - non-residential receptors, including quiet areas;
- 4.3.4 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly $L_{Aeq,T}$ noise levels from construction activities have been calculated at the façade of all assessment locations, which are representative of a number of receptors in the study area.
- 4.3.5 The assessment results, impact criteria and significance criteria for the assessment of the scheme at residential and non-residential receptors are presented in Table 3 and Table 4 respectively.
- 4.3.6 Explanation of the information within Table 3 and Table 4 is provided in Appendix SV-001-000, with the following additional notes:

	Where the significant effect column is highlighted, then a significant effect is identified at the referenced community, or individual non-residential receptor
*	Significant effect – the quantitative impact methodology has identified either: <ol style="list-style-type: none"> 1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or 2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not give rise to a significant effect
~	Significant effect – the forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000)
A	Type of effect – adverse effect
S	Type of effect – significant adverse effect
NA	Type of effect – not generally an adverse effect
B	Type of effect – for non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000
R	Type of receptor - residential
G	Type of receptor - (G1) theatres, large auditoria and concert halls, (G2) sound recording and broadcast studios, (G3) places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (G4) schools, colleges, hospitals, hotels and libraries, and (G5) offices and general commercial premises
T	Receptor design – typical
S	Receptor design - special
H	Existing environment – high existing ambient noise levels, day >75dB, evening >65dB or night >55dB L_{pAeq} at the facade
L	Existing environment – low existing ambient noise levels, day ≤45dB, evening ≤45dB or night ≤35dB L_{pAeq} at the facade
NI	Mitigation effect - identified as likely to qualify for noise insulation under the draft CoCP

Appendix SV-003-022 | Effects arising during construction

Table 3: Assessment of construction noise at residential receptors

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700											
623	Tuppenhurst Lane, Rugeley	59/66 [A]	-	-	Earthworks	A	3	R	T	-	-	-	9	-	-
746	Tuppenhurst Lane, Rugeley	46/51 [A]	-	-	Earthworks	NA	1	R	T	-	-	-	-	-	
5666	Tuppenhurst Lane, Rugeley	34/39 [A]	-	-	Balancing pond earthworks	NA	51	R	T	-	-	-	-	-	
5738	Alandale Avenue, Rugeley	35/37 [A]	-	-	Balancing pond earthworks	NA	24	R	T	-	-	-	-	-	
5818	Harvey Road, Rugeley	39/47 [A]	-	-	Earthworks	NA	61	R	T	-	-	-	-	-	
6042	Bridge Road, Rugeley	41/48 [A]	-	-	Earthworks	NA	45	R	T	-	-	-	-	-	
6336	Proctor Road, Rugeley	41/45 [A]	-	-	Balancing pond earthworks	NA	37	R	T	-	-	-	-	-	
6354	Johns Avenue, Rugeley	39/44 [A]	-	-	Earthworks	NA	11	R	T	-	-	-	-	-	
6455	Millcroft Way, Handsacre, Rugeley	33/37 [A]	-	-	Earthworks	NA	18	R	T	-	-	-	-	-	
6492	Lichfield Road, Handsacre, Rugeley	30/34 [A]	-	-	Viaduct superstructure	NA	10	R	T	-	-	-	-	-	
6607	Barn Road, Handsacre, Rugeley	36/38 [A]	-	-	Earthworks	NA	15	R	T	-	-	-	-	-	
6934	Lichfield Road, Armitage, Rugeley	39/43 [A]	-	-	Balancing pond earthworks	NA	24	R	T	-	-	-	-	-	
7044	Handsacre Crescent, Rugeley	36/39 [A]	-	-	Balancing pond earthworks	NA	46	R	T	-	-	-	-	-	
7181	Lichfield Road, Armitage, Rugeley	45/51 [A]	-	-	Balancing pond earthworks	NA	6	R	T	-	-	-	-	-	
7293	Millcroft Way, Handsacre, Rugeley	37/43 [B]	-	-	Earthworks	NA	14	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [Assessment category A/B/C]	Construction activity resulting in highest forecast noise levels			Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
7426	Rowan Drive, Handsacre, Rugeley	42/46 [A]	-	-	Balancing pond earthworks	NA	32	R	T	-	-	-	-	-	
7467	Rowan Drive, Handsacre, Rugeley	43/48 [A]	-	-	Haul road construction	NA	23	R	T	-	-	-	-	-	
7597	Chestnut Close, Handsacre, Rugeley	51/58 [A]	-	-	Haul road construction	NA	11	R	T	-	-	-	-	-	
7621	Chestnut Close, Handsacre, Rugeley	47/53 [A]	-	-	Balancing pond earthworks	NA	20	R	T	-	-	-	-	-	
7798	Lichfield Road, Armitage, Rugeley	38/42 [A]	-	-	Balancing pond earthworks	NA	21	R	T	-	-	-	-	-	
10729	Cappers Lane, Lichfield	57/60 [A]	-	-	Haul road construction	NA	1	R	T	-	-	-	-	-	
10745	Europa Way, Britannia Enterprise Park, Lichfield	53/59 [B]	-	-	Streethay siding earthworks	NA	1	R	T	-	-	-	-	-	
17473	Whittington Common Road, Whittington, Lichfield	59/66 [A]	-	-	Earthworks	A	2	R	T	L	-	-	4	-	~
17519	Darnford Lane, Lichfield	58/64 [A]	-	-	Bridge superstructure	NA	3	R	T	-	-	-	-	-	
17578	Marsh Lane, Whittington, Lichfield	51/57 [A]	-	-	Earthworks	NA	1	R	T	-	-	-	-	-	
17597	Darnford Lane, Lichfield	52/58 [A]	-	-	Bridge superstructure	NA	1	R	T	-	-	-	-	-	
17721	Cappers Lane, Lichfield	54/57 [A]	-	-	Streethay siding earthworks	NA	8	R	T	-	-	-	-	-	
17748	Park Lane, Huddlesford, Lichfield	66/75 [A]	-	-	Site clearance	A	1	R	T	-	-	-	14	-	~
17758	Cappers Lane, Lichfield	55/58 [C]	-	-	Earthworks	NA	2	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [Assessment category A/B/C]	Construction activity resulting in highest forecast noise levels			Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
17767	Cappers Lane, Lichfield	58/64 [A]	-	-	Haul road construction	NA	1	R	T	-	-	-	-	-	
17774	Cappers Lane, Lichfield	57/63 [C]	-	-	Viaduct superstructure	NA	1	R	T	-	-	-	-	-	
17785	Cappers Lane, Lichfield	63/71 [A]	-	-	Earthworks	A	1	R	T	-	-	-	2	-	-
17800	Cappers Lane, Lichfield	60/65 [A]	-	-	Viaduct superstructure	NA	1	R	T	-	-	-	-	-	
18106	Wood End Lane, Elmhurst, Lichfield	56/59 [A]	-	-	Road construction	NA	4	R	T	-	-	-	-	-	
18521	Lime Way, Streethay, Lichfield	52/58 [A]	-	-	Streethay siding earthworks	NA	8	R	T	-	-	-	-	-	
18547	Rayson Close, Streethay, Lichfield	54/61 [A]	-	-	Streethay siding earthworks	NA	9	R	T	-	-	-	-	-	
18550	Rayson Close, Streethay, Lichfield	53/60 [B]	-	-	Streethay siding earthworks	NA	2	R	T	-	-	-	-	-	
18558	Rayson Close, Streethay, Lichfield	52/59 [A]	-	-	Streethay siding earthworks	NA	13	R	T	-	-	-	-	-	
18665	Wood End Lane, Fradley, Lichfield	59/62 [A]	-	-	Earthworks	NA	1	R	T	-	-	-	-	-	
18978	Wood End Lane, Fradley, Lichfield	54/57 [A]	-	-	Road Site clearance	NA	3	R	T	-	-	-	-	-	
19720	Lichfield Road, Hanch, Lichfield	49/52 [B]	-	-	Earthworks	NA	10	R	T	-	-	-	-	-	
19867	Lichfield Road, Hanch, Lichfield	52/58 [A]	-	-	Utilities diversion	NA	1	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700											
20009	Lichfield Road, Hanch, Lichfield	53/56 [A]	-	-	Utilities diversion	NA	1	R	T	-	-	-	-	-	
20044	Shaw Lane, Hanch, Lichfield	53/62 [A]	-	-	Road construction	NA	1	R	T	-	-	-	-	-	
20090	Shaw Lane, Hanch, Lichfield	59/63 [A]	-	-	Earthworks	NA	2	R	T	-	-	-	-	-	
20138	Shaw Lane, Hanch, Lichfield	58/63 [A]	-	-	Earthworks	NA	1	R	T	-	-	-	-	-	
20395	Wood End Lane, Curborough, Lichfield	47/52 [C]	-	-	Balancing pond Earthworks	NA	1	R	T	-	-	-	-	-	
20441	Wood End Lane, Curborough, Lichfield	68/73 [A]	-	-	Earthworks	A	1	R	T	-	-	-	27	-	~
20527	Bromley Hayes, Lichfield	45/48 [A]	-	-	Bridge superstructure	NA	2	R	T	-	-	-	-	-	
21095	Wood End Lane, Curborough, Lichfield	53/57 [C]	-	-	Viaduct superstructure	NA	5	R	T	-	-	-	-	-	
21213	Bromley Hayes, Lichfield	52/57 [A]	-	-	Earthworks	NA	1	R	T	L	-	-	-	-	
22478	Wood End Lane, Fradley, Lichfield	61/66 [A]	-	-	Viaduct superstructure	A	4	R	T	-	-	-	21	-	~
22642	Burton Road, Streethay, Lichfield	59/63 [C]	-	-	Demolition works	NA	1	R	T	-	-	-	-	-	
22669	Burton Road, Streethay, Lichfield	66/69 [C]	-	-	Earthworks	NA	1	R	T	-	-	-	-	-	
22736	Burton Road, Streethay, Lichfield	61/65 [B]	-	-	Streethay siding earthworks	NA	1	R	T	-	-	-	-	-	
22797	Burton Road, Streethay, Lichfield	57/62 [C]	-	-	Streethay siding earthworks	NA	2	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700											
22853	Burton Road, Streethay, Lichfield	53/58 [C]	-	-	Streethay siding earthworks	NA	3	R	T	-	-	-	-	-	
22879	Burton Road, Streethay, Lichfield	54/60 [C]	-	-	Streethay siding earthworks	NA	3	R	T	-	-	-	-	-	
22924	Holland Close, Streethay, Lichfield	49/55 [C]	-	-	Streethay siding earthworks	NA	7	R	T	-	-	-	-	-	
22961	Holland Close, Streethay, Lichfield	49/55 [A]	-	-	Streethay siding earthworks	NA	5	R	T	-	-	-	-	-	
23242	Ash Tree Lane, Streethay, Lichfield	56/62 [B]	-	-	Streethay siding earthworks	NA	7	R	T	-	-	-	-	-	
23264	Burton Road, Streethay, Lichfield	57/63 [C]	-	-	Streethay siding earthworks	NA	2	R	T	-	-	-	-	-	
23337	Ash Tree Lane, Streethay, Lichfield	54/61 [A]	-	-	Streethay siding earthworks	NA	11	R	T	-	-	-	-	-	
24762	Dyott Close, Streethay, Lichfield	50/55 [C]	-	-	Streethay siding earthworks	NA	4	R	T	-	-	-	-	-	
28123	Lichfield Road, Whittington, Lichfield	54/59 [A]	-	-	Bridge superstructure	NA	2	R	T	-	-	-	-	-	
29081	Common Lane, Whittington Barracks, Lichfield	41/46 [B]	-	-	Demolition works	NA	5	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [Assessment category A/B/C]	Construction activity resulting in highest forecast noise levels			Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700											
29134	Common Lane, Whittington Barracks, Lichfield	43/48 [B]	-	-	Demolition works	NA	1	R	T	-	-	-	-	-	
29256	Tamworth Road, Lichfield	49/55 [B]	-	-	Demolition works	NA	1	R	T	-	-	-	-	-	
29428	Common Lane, Whittington Barracks, Lichfield	41/46 [A]	-	-	Demolition works	NA	1	R	T	-	-	-	-	-	
29572	Chester Road, Whittington Barracks, Lichfield	45/50 [A]	-	-	Demolition works	NA	1	R	T	-	-	-	-	-	
29888	Sandy Lane, Lichfield	53/58 [A]	-	-	Bridge superstructure	NA	3	R	T	-	-	-	-	-	
30592	Lichfield Road, Whittington, Lichfield	51/55 [A]	-	-	Bridge superstructure	NA	2	R	T	-	-	-	-	-	
30770	Darnford Lane, Lichfield	46/52 [A]	-	-	Earthworks	NA	8	R	T	-	-	-	-	-	
30808	Darnford Lane, Lichfield	53/64 [A]	-	-	Utilities diversion	NA	1	R	T	-	-	-	-	-	
31347	Broad Lane, Huddlesford, Lichfield	54/58 [A]	-	-	Streethay siding earthworks	NA	1	R	T	-	-	-	-	-	
31367	Huddlesford Lane, Huddlesford, Lichfield	57/61 [A]	-	-	Streethay siding earthworks	NA	3	R	T	-	-	-	-	-	
31472	Huddlesford Lane, Huddlesford, Lichfield	52/54 [A]	-	-	Streethay siding earthworks	NA	4	R	T	-	-	-	-	-	
33376	Darnford Lane, Lichfield	55/62 [A]	-	-	Utilities diversion	NA	1	R	T	-	-	-	-	-	

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Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
700650	Fradley Junction, Fradley, Lichfield	50/55 [A]			Viaduct superstructure	NA	1	R	T	-	-	-	-	-		
700651	Fradley Junction, Fradley, Lichfield	46/51 [A]			Viaduct superstructure	NA	1	R	T	-	-	-	-	-		
700652	Lichfield Road, Lichfield	39/44 [A]	-	-	Earthworks	NA	4	R	T	-	-	-	-	-		
701099	Millcroft Way, Handsacre, Rugeley	39/44 [A]	-	-	Balancing pond earthworks	NA	101	R	T	-	-	-	-	-		
701100	The Croft Leys, Handsacre, Rugeley	35/37 [A]	-	-	Balancing pond earthworks	NA	139	R	T	-	-	-	-	-		
701101	Tuppenhurst Lane, Handsacre, Rugeley	33/38 [A]	-	-	Balancing pond Earthworks	NA	52	R	T	-	-	-	-	-		
701102	Station Drive, Handsacre, Rugeley	32/37 [B]	-	-	Balancing pond earthworks	NA	31	R	T	-	-	-	-	-		
721014	Wood End Lane, Curborough, Lichfield	64/67 [A]	-	-	Earthworks	A	1	R	T	-	-	-	18	-	~	
721015	Gorse Lane, Fradley	56/59 [A]	-	-	Site clearance	NA	3	R	T	-	-	-	-	-		
721030	Whittington Common Road, Whittington, Lichfield	66/72 [A]	-	-	Earthworks	A	1	R	T	-	-	-	30	-	~	

Table 4: Assessment of construction noise at non-residential receptors

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300/Weekend	Night 2300-0700											
746	Cattery, Tuppenhurst Lane, Rugeley	46/51	-	-	Earthworks	B	1	G4	T	-	-	-	-	-	
10433	Club House, Darnford Lane, Lichfield	49/53	-	-	Earthworks	B	1	G4	T	-	-	-	-	-	
10745	General Commercial, Europa Way, Lichfield	53/59	-	-	Railhead earthworks	B	10	G5	T	-	-	-	-	-	
13325	Factory, Titan Way, Lichfield	47/51	-	-	Railhead earthworks	B	26	G5	T	-	-	-	-	-	
18213	General Commercial, Nanscawen Road, Fradley, Lichfield	55/58	-	-	Earthworks	B	1	G5	T	-	-	-	-	-	
18281	General Commercial, Lancaster Road, Hilliard's Cross	43/47	-	-	Demolition works	B	3	G5	T	-	-	-	-	-	
18665	General Commercial, Wood End Lane, Hilliard's Cross	59/62	-	-	Earthworks	B	11	G5	T	-	-	-	-	-	
19720	General Commercial, Lichfield Road, Hanch, Lichfield	49/52	-	-	Earthworks	B	1	G5	T	-	-	-	-	-	
20178	General Commercial, Watery Lane, Curborough	43/46	-	-	Bridge superstructure	B	1	G5	T	-	-	-	-	-	
20527	General Commercial, Bromley Hayes, Lichfield	45/48	-	-	Bridge superstructure	B	5	G5	T	-	-	-	-	-	
21095	General Commercial, Wood End Lane, Curborough, Lichfield	53/57	-	-	Viaduct superstructure	B	1	G5	T	-	-	-	-	-	


Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300/ Weekend	Night 2300-0700											
21136	General Commercial, Wood End Lane, Curborough	52/55	-	-	Earthworks	B	1	G5	T	-	-	-	-	-	
21312	General Commercial, Burton Old Road, Streethay	48/52	-	-	Railhead earthworks	B	1	G5	T	-	-	-	-	-	
21694	General Commercial, Burton Road, Streethay, Lichfield	48/52	-	-	Railhead earthworks	B	1	G5	T	-	-	-	-	-	
22232	General Commercial, Netherstowe Lane, Curborough	48/51	-	-	Bridge superstructure	B	1	G5	T	-	-	-	-	-	
22478	Office, Wood End Lane, Fradley, Lichfield	61/66	-	-	Viaduct superstructure	B	2	G5	T	-	-	-	-	-	
22736	Office, Burton Road, Streethay, Lichfield	60/65	-	-	Streethay siding earthworks	B	1	G5	T	-	-	-	-	-	
23518	Office, Wellington Crescent, Hilliard's Cross	52/56	-	-	Demolition works	B	15	G5	T	-	-	-	-	-	
23625	General Commercial, Rykneld Street	55/59	-	-	Demolition works	B	1	G5	T	-	-	-	-	-	
24230	General Commercial, Wood End Lane	48/50	-	-	Footpath earthworks	B	2	G5	T	-	-	-	-	-	
24857	General Commercial, Wood End Lane, Hilliard's Cross	47/50	-	-	Footpath earthworks	B	1	G5	T	-	-	-	-	-	
29490	Museum, Chester Road, Whittington	54/58	-	-	Road construction	B	1	G3	T	-	-	-	-	-	
29975	Community Centre, Whittington Barracks, Lichfield	51/56	-	-	Demolition works	B	3	G5	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the facade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300/Weekend	Night 2300-0700											
31367	The Plough Inn, Huddlesford Lane, Huddlesford	57/61	-	-	Railhead earthworks	B	2	G5	T	-	-	-	-	-	
31466	General Commercial, Huddlesford Lane, Huddlesford	51/54	-	-	Railhead earthworks	B	1	G5	T	-	-	-	-	-	
31505	Club, Huddlesford Lane, Huddlesford	55/59	-	-	Railhead earthworks	B	1	G5	T	-	-	-	-	-	
34767	General Commercial, Brookhay Lane, Hilliard's Cross	50/57	-	-	Railhead earthworks	B	1	G5	T	-	-	-	-	-	
700631	Tamworth Road, Whittington Barracks, Lichfield	61/67	-	-	Utilities diversion	B	1	G5	T	-	-	-	-	-	
700632	Tamworth Road, Whittington Barracks, Lichfield	57/62	-	-	Demolition works	B	1	G5	T	-	-	-	-	-	
700647	School, Heath Avenue, Whittington Barracks, Lichfield	50/55	-	-	Demolition works	B	1	G4	T	-	-	-	-	-	
700648	The Thomas Spencer Hall, Church Street, Whittington, Lichfield	45/51	-	-	Earthworks	B	1	G3	T	-	-	-	-	-	
700649	Litchfield Cruising Club, Cappers Lane, Lichfield	62/69	-	-	Earthworks	B	1	G4	S	-	-	-		-	~
700651	General Commercial, Fradley Junction, Fradley, Lichfield	46/51	-	-	Viaduct superstructure	B	1	G5	T	-	-	-		-	




Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300/Weekend	Night 2300-0700											
701066	Tamworth Road, Whittington Barracks, Lichfield	57/62	-	-	Demolition works	B	1	G5	T	-	-	-		-	
701067	Heath Avenue, Tamworth Road, Whittington Barracks, Lichfield	54/58	-	-	Demolition works	B	1	G5	T	-	-	-		-	
701090	Streethay Wharf, Lichfield	60/65	-	-	Streethay siding earthworks	B	1	G4	S	-	-	-		-	
701091	Kings Bromley Wharf, Tewnals Lane, Lichfield	50/52	-	-	Utilities diversion	B	1	G4	S	-	-	-		-	
701101	The Old Peculiar, Tuppenhurst Lane, Handsacre, Rugeley	32/37	-	-	Balancing pond earthworks	B	1	G5	T	-	-	-		-	
721011	Hayes Meadow Primary School, Handsacre	42/47	-	-	Haul road construction	B	1	G3	T	-	-	-		-	
721019	General Commercial, Wood End Lane, Hilliard's Cross	56/59	-	-	Earthworks	B	11	G5	T	-	-	-		-	
721029	Kings Orchard Marina, Streethay, Lichfield	54/58	-	-	Railhead earthworks	B	1	G4	S	-	-	-			~

Airborne sound: indirect effects

- 4.3.7 Construction road traffic associated with the construction phases of the Proposed Scheme would generate airborne noise. Based upon traffic information for the Proposed Scheme, the change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted. The results for potentially significant road links are presented in Table 5.
- 4.3.8 Explanation of the information within Table 5 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

 Where the significant effect column is highlighted, then a significant effect is identified on nearby communities or individual receptors

Change values

-  Yellow denotes a minor impact – a change is of 3-5dB or 1-3dB where a high existing sound level is identified
-  Orange denotes a moderate impact – a change is of 5-10dB or 3-5dB where a high existing sound level is identified
-  Red denotes a major impact – a change is of >10dB or >5dB where a high existing sound level is identified

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Table 5: Assessment of construction traffic noise levels

Road name	Link	Future baseline sound level (dB)	Future baseline sound level + construction traffic (dB)	Change (dB)	Significant effect
		Daytime $L_{pAeq,16hr\ 0700-23:00}$ free-field	Daytime $L_{pAeq,16hr\ 0700-2300}$ free-field		
A51 Tamworth Road	A51 Tamworth Road overbridge compound to Cricket Lane	69.1	69.2	+0.1	
Whittington Common Road	Lichfield Road underbridge compound to the A51 Tamworth Road	61.1	61.6	+0.5	
Capper's Lane	Park Lane to Capper's Lane viaduct compound	62.8	66.9	+4.1	
Capper's Lane	A38 to A5127 Burton Road	70.0	70.4	+0.4	
Park Lane	Capper's Lane to the Streethay siding	55.8	64.5	+8.7	
A38	A38 London Road to Capper's Lane	79.9	81.2	+1.3	
A38	Capper's Lane to Wood End Lane	79.7	80.4	+0.7	
A5127 Burton Road	A38 to Capper's Lane	69.0	69.4	+0.4	
A5	A38 London Road roundabout to the A5148 roundabout	73.8	74.0	+0.2	
A5127 Birmingham Road	A5 to A461	70.4	70.7	+0.3	
Wood End Lane	A515 Tewnals Lane to Curborough flyover compound	66.4	67.0	+0.6	
A515 Tewnals Lane	Common Lane to Wood End Lane	67.6	67.9	+0.3	

4.4 Assessment of significant effects

Residential receptors: direct effects – individual dwellings

- 4.4.1 Taking account of the avoidance and mitigation measures set out in Volume 2: Report 22, no residential buildings are forecast to experience noise levels higher than the noise insulation trigger levels as defined in the draft CoCP. For daytime construction the trigger level is an equivalent continuous noise level of 75dB² measured outdoors.
- 4.4.2 The mitigation measures, including noise insulation, will reduce noise inside all dwellings, such that it does not reach a level where it would significantly affect residents¹.

Residential receptors: direct effects – communities

- 4.4.3 The avoidance and mitigation measures in this area will avoid airborne construction noise adverse effects¹ on the majority of receptors and communities.
- 4.4.4 It is anticipated that there may be some night-time working during road and rail possession periods. Night-time construction activities in this area would be restricted to where the route crosses existing railway lines, roads or where newly constructed roads tie into the existing road network for reasons of safety, engineering practicability or to reduce the impact on existing transport. These works are likely to be of short duration, and be limited in the types of activities being undertaken. As a consequence, it is expected that the noise effects from night time activities would be limited in duration and hence would not be considered significant.
- 4.4.5 In the vicinity of Streethay, a construction siding railhead is also located. This facility will be temporary and be established and operated during the construction phase of HS2 for the movement of excavated materials, construction material deliveries and as an access to the HS2 trace for ballast and track laying.
- 4.4.6 The railhead will be connected to the classic rail network so that the movements of materials both into and out of the railhead can be made by rail at any time during the construction period, however, the loading and unloading of rail vehicles will only take place during daytime periods.
- 4.4.7 The movement of trains to and from the sidings on the classic rail network will utilise available train paths and will comprise a very small percentage of total train movements on the classic rail network. The likely residual effects associated with train movements to and from railheads during the construction of the Proposed Scheme are therefore not regarded as significant.
- 4.4.8 With regard to noise outside dwellings, the assessment of temporary effects takes account of construction noise relative to existing sound levels. Users who occasionally sleep overnight at locations such as moorings, camp sites or caravan parks that do not permit long term residential use are not considered to be significantly affected by noise due to construction of the Proposed Scheme, due to the short and irregular exposure to noise from the Proposed Scheme.

² L_{pAeq,0800-1800} measured at the facade

- 4.4.9 In locations with lower existing sound levels³, construction noise effects¹ are likely to be caused by changes to noise levels outside dwellings. These may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life. These effects are considered to be significant when assessed on a community basis taking account of the local context³.
- 4.4.10 In this area, the mitigation measures reduce the effects of outdoor construction noise on the acoustic character around the local residential communities such that the adverse effects identified are considered to be not significant.

Residential receptors: indirect effects

- 4.4.11 A minor impact, due to construction traffic, is predicted along Cappers Lane and the A38; a moderate impact is predicted along Park Lane. Taking account of incorporated mitigation, the limited number of properties adjacent to these roads and the predicted change in traffic noise levels; no indirect construction noise significant effects have been identified.
- 4.4.12 In certain instances a qualitative assessment has been undertaken. This was the case for assessment of noise due to construction traffic along Cricket Lane, the A5206 London Road, the A51 Western By-Pass and the A515 Featherbed Lane.
- 4.4.13 Construction traffic accesses the A51 Tamworth Road from the A38 via Cricket Lane and the A5206 London Road. It is anticipated that vehicle numbers along these roads are similar to those on the A51 Tamworth Road. The qualitative assessment has therefore concluded that the impact would be <1dB, hence no significant temporary noise effect is considered likely.
- 4.4.14 Construction traffic accesses A51 Western By-Pass road, via the A5127 Birmingham Road. It is anticipated that vehicle numbers along these roads are similar to those on A5127 Birmingham Road. The qualitative assessment has therefore concluded that the impact would be <1dB, hence no significant temporary noise effect is considered likely.

Non-residential receptors: direct effects

- 4.4.15 Significant construction noise or vibration effects on non-residential receptors are unlikely to occur in this area.

Non-residential receptors: indirect effects

- 4.4.16 Significant noise effects on non-residential receptors arising from construction traffic are unlikely to occur in this area.

Cumulative effects from the Proposed Scheme and other committed development

- 4.4.17 This assessment has considered the potential cumulative construction noise effects of the proposed scheme and other committed developments⁴. In this area, there is no development that would be built at the same time as the Proposed Scheme and

³ Further information is provided in Volume 5: Appendix SV-001-000.

⁴ Refer to Volume 5: Appendix CT-004-000.

accordingly, construction noise or vibration from the Proposed Scheme is unlikely to result in any significant cumulative noise effects.